ABSTRACT OF THE DISCLOSURE

The present invention provides a processing apparatus and a processing method, both of which can carry out a low-temperature process to allow active gas species to react with an oxide film on an object to be processed to form a product film and a heating process to heat the object to a predetermined temperature to evaporate the product film, in succession. This processing apparatus 12 is provided with a shielding plate 103 capable of entering a gap between the object W and a transparent window 28 and also withdrawing from the gap. On condition that the shielding plate 103 is closed to cut off irradiation heat from the transparent window 28, the product film is formed by allowing the active gas species of NF_3 gas to react with a native oxide film on the object under the low-temperature condition. After that, upon closing the shielding plate 103, the native oxide film is removed by applying heat irradiated from a heating lamp 36 to the product film through the transparent window 28. Additionally, the apparatus includes a low-temperature processing chamber 207 allowing NF_3 gas to react with the native oxide film at a low temperature and a heating chamber 209 for heating the product film, independently.